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# EUFOREA treatment algorithm for allergic rhinitis*

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## To the Editor:

Allergic rhinitis (AR) is the most common chronic inflammatory disease, affecting an estimated 100 million Europeans [(1)]. Despite a substantial burden on individuals, society and health economies [(2)], AR remains under-diagnosed, under-estimated (in terms of severity), and under-treated [(3)]. Although effective and safe treatments exist, patients wait too long to seek medical advice, often preferring to self-manage at drug stores and at the pharmacy [(4)]. Other barriers to access of appropriate and effective AR treatment exist at patient, pharmacist and physician levels, including inability to recognize AR and diagnose it, inappropriate AR medication prescription/use [(5)], poor concordance

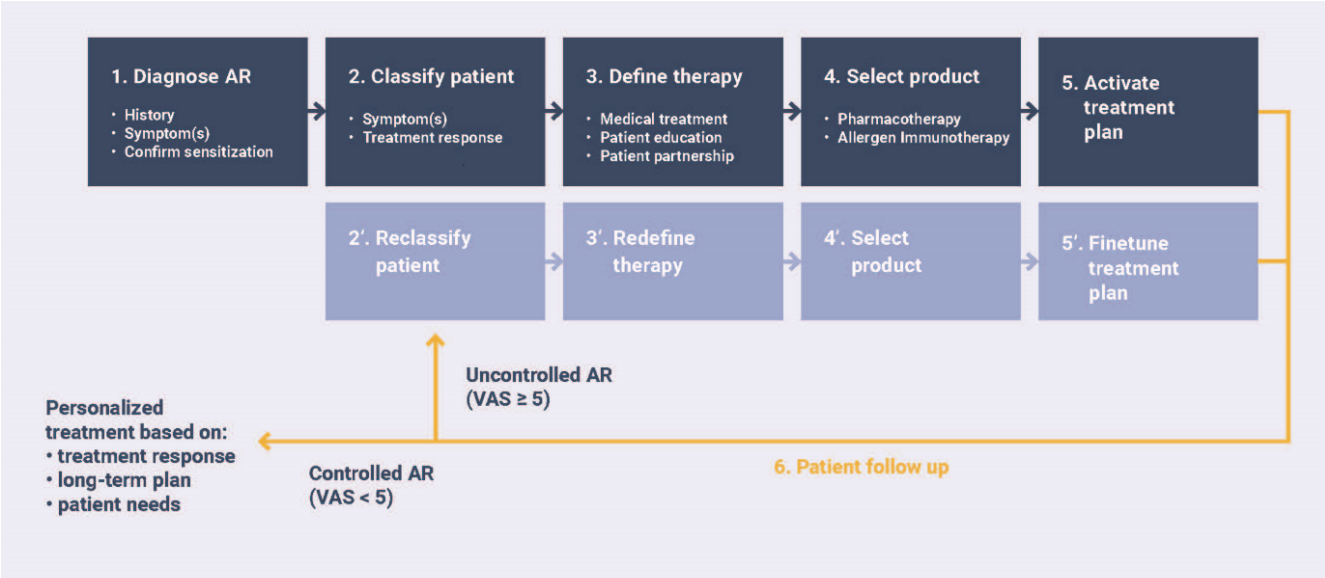


Figure 1. EUFOREA allergic rhinitis pocket guide implementation pathway. AR: allergic rhinitis; European Forum for Research & Education in Allergy & Airway Diseases; VAS: visual analogue scale.

with AR treatment regimens and/or lack of awareness of new medications. There has, therefore, been a shift towards a more patient-centred approach to AR management, with a focus on personalized, predictive, preventative and participatory strategies [6,7]. The visual analogue scale (VAS) was introduced as the common language of AR control, improving patient-healthcare provider communication, and informing disease control status and treatment recommendations [8]. However, guidelines based solely on VAS may not reflect the needs of physicians and patients in real-life, since VAS are not routinely used in everyday practice and may not capture the profiles of all presenting patients.

The European Forum for Research & Education in Allergy & Airway Diseases (EUFOREA) in collaboration with global key opinion leaders in the field of chronic inflammatory airway disease, has developed an AR pocket guide with a treatment algorithm to expedite access to AR treatment and facilitate coordinated care. The algorithm is designed for real-life use. Its aim is simple: to improve AR knowledge and streamline the transition of patients between self-, pharmacy-, GP- and specialist-care, allowing more coordinated care. The guide is practical and easy-to-use in everyday clinical practice for any care provider. It is concise and patient-centred, capturing every patient that attends the outpatient clinic of any care provider. This guide provides a 'what to do' checklist when assessing AR patients, including a list of symptoms suggestive of AR, questions on suspected asthma, and instructions on how to use the AR VAS. The AR pocket guide is implemented in 5 easy steps: (i) diagnose AR, (ii) classify patients, (iii) define therapy, (iv) select product, and (v) activate treatment plan (Figure 1). Diagnosis involves taking a comprehensive history and investigating signs and symptoms, confirmed (if necessary) by identification of sensitizing allergen(s) linked to symptoms [9]. The patient is classified according to disease control and response to treatment using the AR VAS (retrospectively, if VAS is not already routinely monitored). Approach to treatment is defined, including discussion of potential benefits of allergen avoidance (whenever possible) and other provoking triggers, saline nasal sprays/douching and available treatment options. Patient education is central at all stages (e.g. disease information, awareness of symptoms, importance of adherence and correct use of intranasal sprays). Patient participation in the decision-making process and in goal-setting is encouraged, and therapy matched to these goals and to patient preference.
AR treatment is selected depending on type and history of patient, disease control (assessed by VAS) and point of care (i.e. pharmacy, GP or specialist) (Figure 2).

**Treatment Step 1:** Patients with suspected AR presenting to any care provider. These patients should be treated with an intranasal corticosteroid (INS), non-sedating oral anti-histamine (OAH) or intranasal anti-histamine (INAH). Physicians' clinical experience and patient symptoms, preferences and expectations, provoking triggers and co-morbidities should be taken into account for optimal outcomes.

**Treatment Step 2:** Patients who have tried and failed (i.e. VAS score ≥5/10 cm) Step 1 treatment at the pharmacy or previously at physician level. AR diagnosis should be confirmed, medication adherence checked, and co-morbidities evaluated. Treatment should be stepped up to fixed dose INS/INAH. Add-on therapy to INS is not recommended.

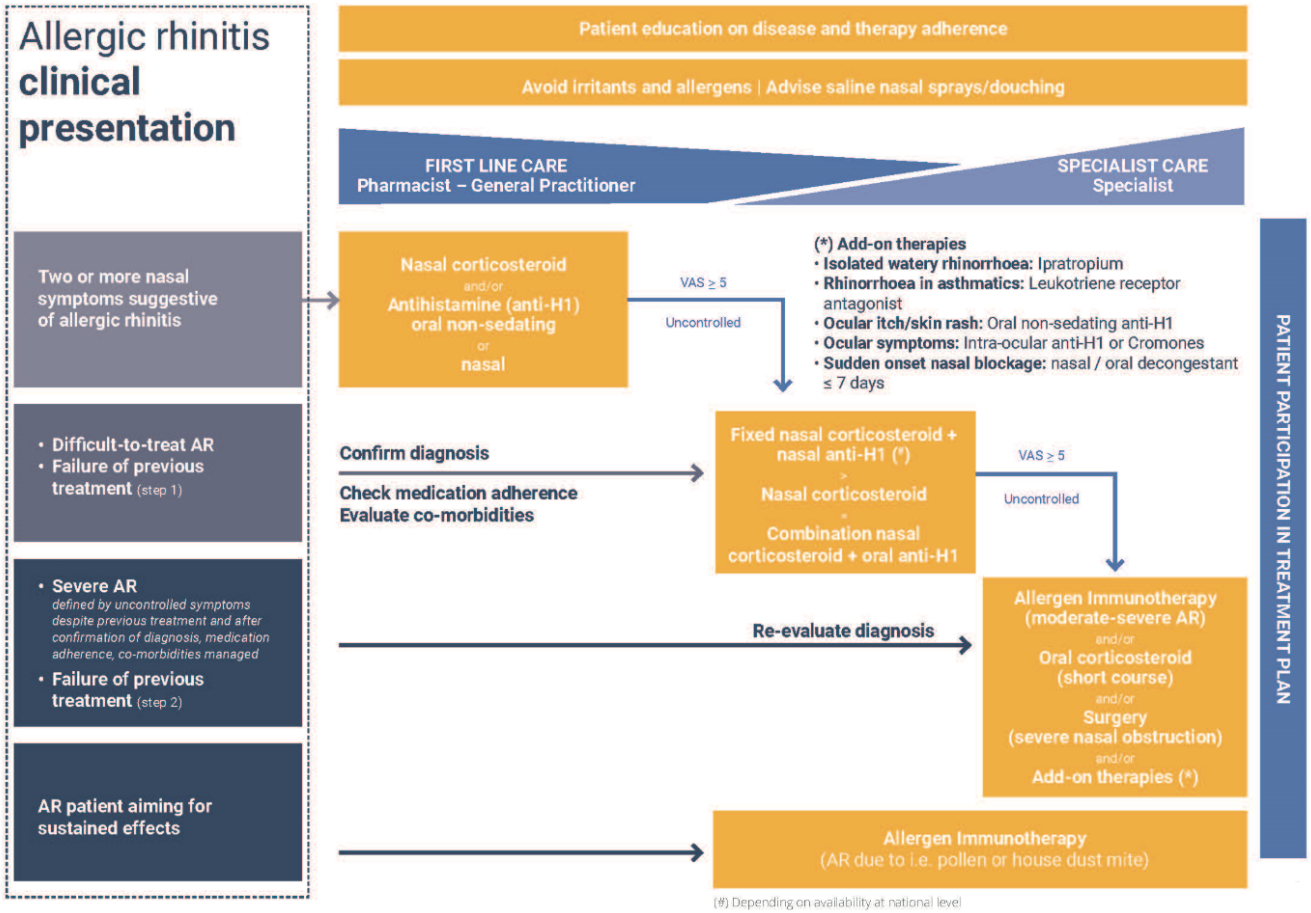


Figure 2. EUFOREA allergic rhinitis pocket guide treatment algorithm. AR: allergic rhinitis; VAS: visual analogue scale.

**Treatment Step 3:** Patients who have tried and failed Step 2 treatment (VAS remains ≥5/10 cm) or those who present with severe symptoms. AR diagnosis should be (re-)evaluated, and symptom-directed add-on therapies to fixed dose INS/INAH considered (e.g. ipratropium, leukotriene receptor antagonist; non-sedating OAH, ocular anti-histamine/cromone and nasal/oral decongestant (≤7 days)) (Figure 2). Other Step 3 treatment options to consider include allergen-specific immunotherapy (AIT), short course OCS and surgery (for those with severe pharmacological therapy-resistant nasal obstruction), at physicians' discretion, considering availability, and risk/benefit ratio.

AIT (subcutaneous or sublingual) is recommended for those patients looking for a sustained reduction of their rhinitis symptoms (if available and if appropriate to the patient's sensitization pattern, and their preference, lifestyle, adherence history and comorbidities (e.g. asthma)). AIT may be considered for patients with uncontrolled moderate-to-severe AR (+/- conjunctivitis) linked to exposure to allergens, with a confirmed IgE sensitization to these allergens and with inadequate control of symptoms despite pharmacotherapy and allergen avoidance measures and/or unacceptable adverse effects of medication.

The next step involves the design and activation of a personalized treatment plan by prescribing medication and explaining the expected response and treatment duration with the patient (Figure 1). It is essential that physicians explain the criteria for a return clinic visit (e.g. sustained VAS score ≥5/10, adverse event). Use of digital technology to support adherence and to evaluate disease control may be suggested. A patient review (actual or digital) should be scheduled. If AR remains uncontrolled (i.e. sustained VAS score ≥5/10 cm) despite completion of the implementation pathway (Figure 1), then AR needs to be re-classified, therapy re-defined, product re-selected and the treatment plan fine-tuned. The aim is to devise a treatment plan (with patient collaboration) which provides AR control, a treatment response acceptable to the patient, suitable for long-term implementation and in compliance with patient needs.

The EUFOREA AR pocket guide with novel treatment algorithm designed for use in real-life, is concise, simple to use, suitable for all stakeholders including pharmacists, primary care physicians, ENT doctors, pulmonologists, allergists and paediatricians, and provides evidence-based and expert-endorsed AR management recommendations. This practical guide has the potential to ensure timely access to AR treatment, taking us one step closer to precision medicine, delivering the right treatment to the right

patient at the right time.
The full pocket guide is available on the EUFOREA website (https://www.euforea.eu/).

## Conflict of interest

PWH: lecture fees and/or participation at expert board meetings of ALK, Stallergenes, Mylan, Novartis and Sanofi; GS: chaired the BSACI AR guidelines, has given paid lectures for and an education programme for EUFOREA. She also chairs the EAACI Ethics Committee, the Independent data monitoring committee for an ALK allergen immunotherapy trial and the Rhinology and Laryngology Research Fund and has given lectures for and/or advised ALK, Bayer GSK, Mylan, Stallergenes; CB: ALK, Stallergenes, Mylan; GWC: has received research grants, as well as lecture or advisory board fees from, A. Menarini, Alk-Abello, Allergy Therapeutics, Anallergo, AstraZeneca, Medimmune, Boehringer Ingelheim, Chiesi Farmaceutici, Circassia, Danone, Faes, Genentech, Guidotti-Malesci, GlaxoSmithKline, Hal Allergy, Merck, Merck Sharp & Dome, Mundipharma, Novartis, Orion, Sanofi-Aventis, Sanofi, Genzyme/Regeneron, Stallergenes, UCB Pharma, Uriach Pharma, Teva, Thermo Fisher, and Valeas; ZD: Apart from academic affiliations, ZD acts as Executive and Scientific Medical Director at a phase I/II pharmacological unit (QPS-NL), which performs clinical studies for pharmaceutical companies. In the past 3 years, ZD received honoraria, consultancy and speaker fees from Acucort, Astrazeneca, ALK, Aquilon, Boehringer Ingelheim, CSL, HAL Allergy, MSD, Sanofi-Genzyme; PG: has receieved lecture fees and/or participation at expert board meetings of Ablynx, ALK, Argenx, ALK, Astra-Zeneca, Genentech, HAL-Allergy, Novartis, Roche, Regeneron, Sanofi, and Stallergenes-Greer; RH: consultant with Medtronic, Olympus, Novartis and NeilMed pharmaceuticals. He has also been on the speakers' bureau for Glaxo-Smith-Kline, Meda Pharmaceutical, Seqiris and AstraZeneca. Research funding from Neilmed and Glaxo-Smith-Kline. CH: Advisory Board for Sanofi-Genzyme, Astra Zeneca, Olympus and Smith and Nephew; LK: has received research grants from Allergy Therapeutics/Bencard, Great Britain/Germany; ALK-Abelló, Denmark; Allergopharma, Germany; ASIT Biotech, Belgium; AstraZeneca, Sweden, Biomay, Austria, Boehringer Ingelheim, Germany, Circassia, USA; Stallergenes, France; Cytos, Switzerland; Curalogic, Denmark; HAL, Netherlands; Hartington, Spain; Lofarma, Italy; MEDA/Mylan, Sweden/USA; Novartis, Switzerland, Leti, Spain; ROXALL, Germany; GlaxoSmithKline (GSK), Great Britain; Sanofi, France and/or has served on the speaker's bureau or was consulting for the above mentioned pharmaceutical companies. LK is the current president of AeDA (German Society of Applied Allergology), a NAS of EAACI and Chair of the EAACI ENT section. VJL: has receive lecture and advisory board fees from Abbott, GSK, Johnson & Johnson, Novartis and Sanofi; DP: declares board membership with Aerocrine, Amgen, AstraZeneca, Boehringer Ingelheim, Chiesi, Mylan, Mundipharma, Napp Pharmaceuticals, Novartis and Teva; consultancy agreements with Almirall, Amgen, AstraZeneca, Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Mylan, Mundipharma, Napp Pharmaceuticals, Novartis, Pfizer, Teva and Theravance; grants and unrestricted funding for investigator-initiated studies (conducted through Observational and Pragmatic Research Institute Pte Ltd) from Aerocrine, AKL Research and Development Ltd, AstraZeneca, Boehringer Ingelheim, British Lung Foundation, Chiesi, Mylan, Mundipharma, Napp Pharmaceuticals, Novartis, Pfizer, Respiratory Effectiveness Group, Teva, Theravance, UK National Health Service and Zentiva; payment for lectures/speaking engagements from Almirall, AstraZeneca, Boehringer Ingelheim, Chiesi, Cipla, GlaxoSmithKline, Kyorin, Mylan, Merck, Mundipharma, Novartis, Pfizer, Skyepharma and Teva; payment for manuscript preparation from Mundipharma and Teva; payment for the development of educational materials from Mundipharma and Novartis; payment for travel/accommodation/meeting expenses from Aerocrine, AstraZeneca, Boehringer Ingelheim, Mundipharma, Napp Pharmaceuticals, Novartis and Teva; funding for patient enrolment or completion of research from Chiesi, Novartis, Teva and Zentiva; stock/stock options from AKL Research and Development Ltd which produces phytopharmaceuticals; owns 74% of the social enterprise Optimum Patient Care Ltd (Australia and UK) and 74% of Observational and Pragmatic Research Institute Pte Ltd (Singapore); and is a peer reviewer for grant committees of the Efficacy and Mechanism Evaluation programme and Health Technology Assessment; DR: Has received grants or payments from AZ,GSK,BI,Novartis, Regenron, Chiesi and Mylan; SSa: has acted as paid consultant for ERT, Novartis, Sanofi Pharma, and Roche Products; MHS received research grants via Imperial College London from ASIT biotech, Regeneron, Merck, Allergopharma and UCB, and received lecture fee from ALK-Abelló, Allergopharma, Alletgy Therapeutic; MW: Fees for lectures or advisory boards: ALK-Abelló, Allergopharma, AstraZeneca, Bencard, Genzyme, HAL Allergie, LETI Pharma, MEDA Pharma, Novartis, Sanofi Aventis, Stallergenes, Teva. Grants for clinical studies: Allakos, AstraZeneca, F. Hoffmann-La Roche, GlaxoSmithKline, Otonomy, Strekin; SSe: Employed by Change Accelerator in Respiratory Disease; WJF: Grants from Meda, Allergy Therapeutics. GSK and ALK. LB, LOC, ABS, ASC, JC, LD, SD, ADK, JR, GR, PSJ, GS, PS, AS, UW: no conflict of interest to report.

## Authorship contribution

PWH, GS and WJF have made the draft of the algorithm and manuscript, with active participation and input in the discussion and finetuning of the algorithm and manuscript by all experts listed as co-author.

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